METRIC

MIL-PRF-51527A(EA)
13 March 2000

SUPERSEDING
MIL-F-51527(EA)
22 May 1990,
MIL-F-51525
15 July 1996

PERFORMANCE SPECIFICATION

FILTER SET, GAS-PARTICULATE, 340 CMH (200 CFM)

Reactivated for New Design after 13 March 2000

This specification is approved for use by the U.S. Army Soldier and Biological Chemical Command (SBCCOM), Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers 2 types of gas-particulate filter sets rated at 340 cubic meters per hour (cmh) (200 cubic feet per minute (cfm)) for use in collective protection configurations (see 6.1):

- Type I - Filter set, gas-particulate, 340 cmh (200 cfm) for Advanced Integrated Collective Protection Systems (AICPS).
- Type II - Filter set, gas-particulate, 340 cmh (200 cfm) for land based Collective Protection Equipment (MCPE), for shipboard Collective Protection Systems (CPS), and for the fan filter assembly of the transportable CPS.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Technical Director, U.S. Army Edgewood Chemical Biological Center, ATTN: AMSSB-REN-SS, Aberdeen Proving Ground, MD 21010-5424 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4240

Attachment 003

Each filter set consists of a separate gas and particulate filter. This specification should be used in conjunction with MIL-PRF-51526 on particulate filters for the purchase of gas-particulate filter sets. No separate specification for gas filters is available.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to insure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed. The latest document version shall apply.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following Government documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

SPECIFICATIONS

DEPARTMENT OF DEFENSE

MIL-PRF-51526	-	Filter, Particulate 340 cmh (200 cfm)
MIL-S-901	-	Shock Test, High-Impact Shipboard Machinery, Equipment, and Systems, Requirements for

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-167-1	-	Mechanical Vibrations of Shipboard Equipment
MIL-STD-282	-	Military Standard, Filter Units, Protective Clothing, Gas-Mask Components and Related Products: Performance Test Methods
MIL-STD-810	-	Environmental Test Methods and Engineering Guidelines

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

U.S. ARMY EDGEWOOD CHEMICAL BIOLOGICAL CENTER

DRAWINGS

5-19-6120	-	Housing, Gas-Particulate Filter, 1 Filter
5-19-6121	-	Housing, Gas-Particulate Filter, 2 Filter
5-19-12983	-	Housing, NBC Filter, 200 CFM

PURCHASE DESCRIPTIONS

EA-DTL-1704	-	Carbon, Activated, Impregnated, Copper-Silver-Zinc-Molybdenum-Triethylenediamine (ASZM-TEDA)

(Copies are available from Technical Director, U.S. Army Edgewood Chemical Biologcal Center, ATTN: AMSSB-REN-SE, Aberdeen Proving Ground, MD 21010-5424.)

NAVAL SEA COMMAND

DRAWINGS

53711-6263500	-	Filter System, CPS
53711-6573697	-	Filter System, Navy Shipboard Selected Area Collective Protection System (SACPS)
SS200-AG-MMM-010	-	Navy Shipboard Collective Protection System(CPS) Technical Manual, CBR Filter System Operation and Maintenance
SS200-AL-MMM-010	-	Technical Manual for Navy Shipboard Selected Area Collective Protection System (SACPS) System Description, Operation, and Maintenance

(Copies are available from Naval Surface Warfare Center Dahlgren Division, 17320 Dahlgren Road, Code G52, Dahlgren, VA 22448-5100.)

CODE OF FEDERAL REGULATIONS

40 CFR Part 261 - Identification and Listing of Hazardous Waste

(Copies are available from the U.S. Government Printing Office, Washington, DC 20402)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless other-

wise specified, the issues of documents not listed in the DoDISS are the issue of the documents cited in the solicitation (see 6.2).

AIR-CONDITIONING AND REFRIGERATION INSTITUTE

ARI 700 - Specifications for Fluorocarbon and Other Refrigerants

(Application for copies should be addressed to Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112-5704.) (http://global.ihs.com)

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS

Publication 0099 - Threshold Limit Values and Biological Exposure Indices

(Application for copy should be addressed to 1330 Kemper Meadow Dr., Suite 600, Cincinnati, OH 45240.) (http://www.acgih.org/)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B209 - Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate

ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber

ASTM D2867 - Moisture in Activated Carbon

(Application for copies should be addressed to ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Materials. The filter set shall be constructed so that it conforms to the requirements of this specification. The materials of construction shall not be capable of having any adverse effects on human health during normal use. The contractor shall select materials which pose no potential inhalation hazard to the user, and whose normal use will not exceed the 8-hour time weighted average threshold limit values published by the American Conference of Governmental Industrial Hygienists (ACGIH) (see 6.2). At the time of disposal, unused and uncontaminated filters shall not be a Resource Conservation Recovery Act hazardous waste according to

characteristics cited in 40 CFR 261.21–261.24 and shall not be listed as specific hazardous waste chemicals in 40 CFR 261.33(e) and (f).

3.1.1 Adsorbent media, gas filter. The adsorbent media shall fully meet all of the requirements in the latest version of EA–DTL–1704 for ASZM–TEDA carbon.

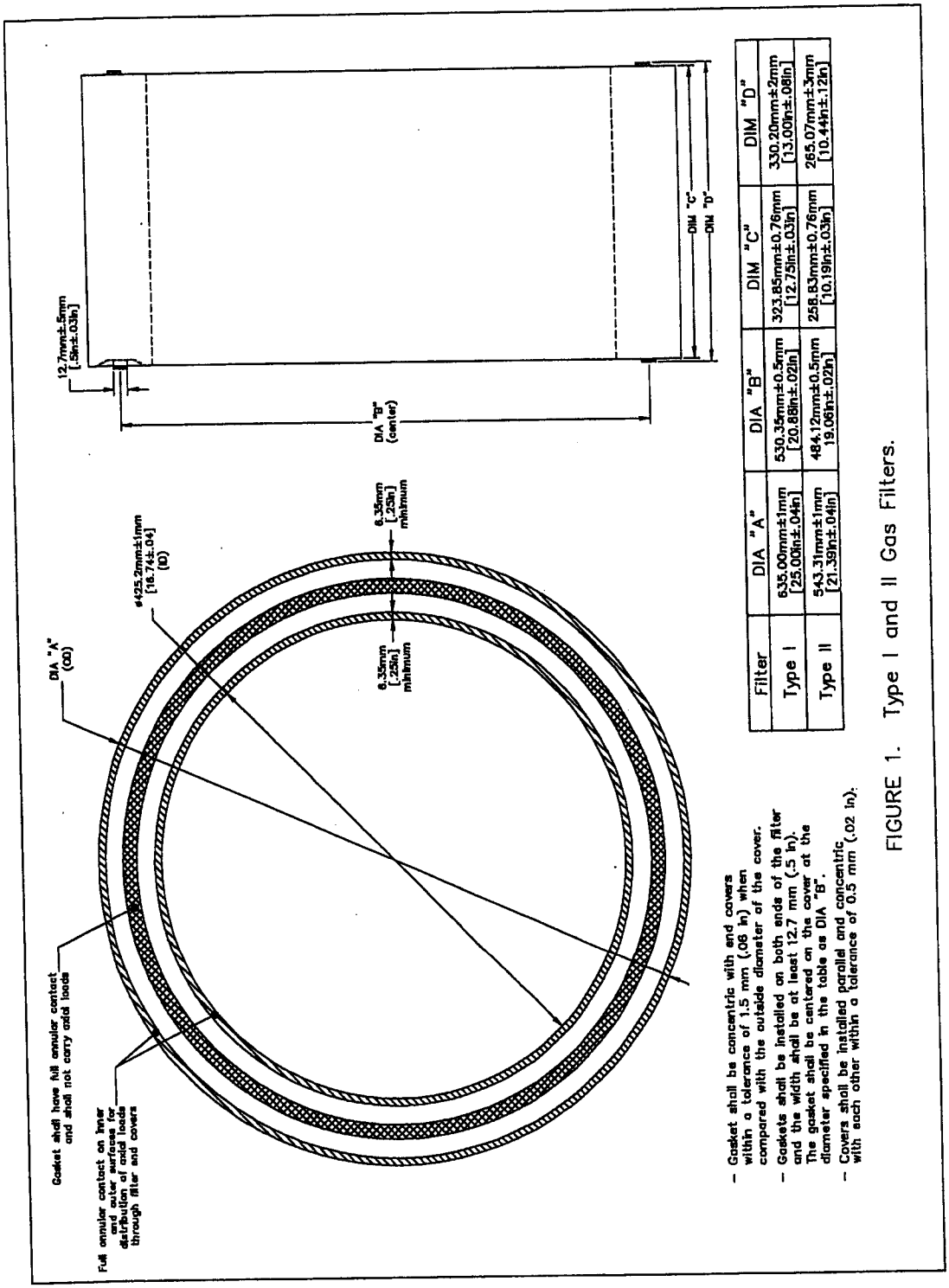
3.2 First article. When specified (see 6.2), a sample shall be subjected to first article inspections in accordance with 4.2. The particulate filter must meet all requirements specified in MIL–PRF–51526.

3.3 Interface requirements.

3.3.1 Compatibility with filter housing. Each filter in the set shall be cylindrical in form and configured so that air shall flow through the filter radially outward for compatibility with its intended filter housing.

3.3.1.1 Type I filters. Each filter set shall contain one gas and one particulate filter that are separable and not permanently attached to each other. The filter set shall be of a size that fits inside the intended filter housing (Drawing 5–19–12983). Each filter shall fit easily into the housing and be removed with no damage to itself or the surrounding components. The particulate filter shall meet all interface requirements for a Type I filter stated in MIL–PRF–51526. The gas filter must meet the interface dimensions in Figure 1. Each end of the filter or end cover shall contain one groove for gasket location. The gasket shall be grade number 2C1 of ASTM D1056, seamless, have a thickness of 0.787 cm (0.31 in) and be made of a material which has fuel and chemical agent permeation rates no higher than those of neoprene. The gasket shall be permanently attached to the filter with an adhesive.

3.3.1.2 Type II filters. Each filter set shall contain one gas and one particulate filter that are separable and not permanently attached to each other. The filter set shall be of a size that fits inside the intended filter housings (Drawings 5–19–6120, 5–19–6121, and 53711–6263500). Each filter shall fit easily into the housing and be removed with no damage to itself or the surrounding components. The particulate filter shall meet all interface requirements for a Type II filter stated in MIL–PRF–51526. The gas filter must meet the interface dimensions in Figure 1. Each end of the filter or end cover shall contain one groove for gasket location. The gasket shall be grade number 2C1 of ASTM D1056, seamless, have a thickness of 0.787 cm (0.31 in) and be made of a material which has fuel and chemical agent permeation rates no higher than those of neoprene. The gasket shall permanently attached to the filter with an adhesive.



Filter	DIA "A"	DIA "B"	DIM "C"	DIM "D"
Type I	635.00mm±1mm [25.00in±.04in]	530.35mm±0.5mm [20.88in±.02in]	323.85mm±0.76mm [12.75in±.03in]	330.20mm±2mm [13.00in±.08in]
Type II	543.31mm±1mm [21.39in±.04in]	484.12mm±0.5mm 19.06in±.02in]	258.83mm±0.76mm [10.19in±.03in]	265.07mm±3mm [10.44in±.12in]

FIGURE 1. Type I and II Gas Filters.

3.3.2 Interchangeability. Each gas and particulate filter and any associated gasket shall be individually interchangeable (replaceable) by one of similar form, fit and function without modification of the filter housing.

3.3.3 Weight. The weight of a Type I filter set shall be no greater than 45.4 kilograms (100 pounds) while unpackaged. The weight of a Type II filter set shall be no greater than 22.7 kilograms (50 pounds) while unpackaged and no greater than 31.8 kilograms (70 pounds) while packaged.

3.4 Operating requirements.

3.4.1 Airflow resistance. The gas filter shall have a rated flow of 340 cmh (200 cfm) at standard conditions (21° C and 1 atm (70° F and 1013 mbar)). The airflow resistance shall not exceed the airflow resistance (pressure drop) of 14.3 centimeters (5.6 inches) water gage (w.g.) for the Type I gas filter and 11.4 centimeters (4.5 inches w.g.) for the Type II gas filter when airflow is 340 cmh (200 cfm) at standard conditions. See MIL–PRF–51526 for airflow resistance requirements for particulate filter.

3.4.2 Leakage. The gas filter of Type I and II filter sets shall not leak when a concentration of 1000 parts per million (ppm) of R–134a (1,1,1,2) tetrafluoroethane refrigerant is introduced at the filter inlet. A filter leak is defined as the presence of 1 ppm or more of R–134a in the effluent air within 2 minutes after the introduction of the refrigerant at the inlet.

3.4.3 Gas life, Cyanogen Chloride (CK). Each sample adsorbent specimen obtained from the filling process of the gas filter shall have a CK life of no less than 95% of that specified in EA–DTL–1704.

3.4.4 Gas life, Dimethylmethylphosphonate (DMMP). The DMMP life of the gas filter shall be at least 200 minutes if the filter is Type I and at least 60 minutes if the filter is Type II when the influent DMMP concentration is 5000 mg/m^3 at rated flow.

3.5 Environmental requirements.

3.5.1 Resistance to hot/cold temperature. Each filter set shall show no ignition or structural damage as a result of temperature conditioning between –51 to 71° C (–60 to 160° F) and be capable of meeting operating requirements in 3.4.1 and 3.4.2 thereafter.

3.5.2 Structural integrity.

3.5.2.1 Resistance to structural deformation. The gas filter and particulate filter shall be capable of withstanding repeated applications of a quasi–static mechanical load of 12900 newtons (2900 pounds) in the axial direction. Each gasket shall not become dislodged from the filter by the process of loading a filter into a housing and removing it.

3.5.2.2 Resistance to shock. After shock treatment, the gas filter shall meet the DMMP life requirement in 3.4.4 and the particulate filter shall meet the filtration efficiency requirement in MIL-PRF-51526.

3.5.2.3 Resistance to vibration. After vibration treatment, the gas filter shall meet the DMMP life requirement in 3.4.4 and the particulate filter shall meet the filtration efficiency requirement in MIL-PRF-51526.

3.5.2.4 Resistance to rough handling. After rough handling consisting of two hundred 19-millimeter drops in 15 minutes, the gas filter shall meet the DMMP life requirement in 3.4.4 and the particulate filter shall meet the filtration efficiency requirement in MIL-PRF-51526.

3.5.3 Resistance to fungus and mildew. The materials of construction shall not support fungus and mildew growth beyond trace levels.

3.5.4 Resistance to corrosion. Any metallic construction material shall resist salt fog corrosion to an extent equal or greater than anodized aluminum when the aluminum alloy number is in the 3000 to 5000 series of ASTM B209.

3.5.5 Resistance to overpressure. The particulate filter shall meet the overpressure requirements in MIL-PRF-51526.

3.5.6 Dust capacity. The particulate filter shall meet the dust capacity requirements in MIL-PRF-51526.

3.5.7 Flammability. The particulate filter shall meet the flammability requirements in MIL-PRF-51526.

3.6 Ownership and support.

3.6.1 Moisture content. To enhance storage of the gas filter, the humidity conditions during manufacturing, materials handling, and packaging shall be such that the moisture content of adsorbent in the packaged gas filter shall not exceed 3.0 percent by weight.

3.6.2 Identification markings. Each filter in the set shall contain identification markings. Markings shall be legible using contrasting ink and ½ inch high bold font. The ink shall retain its color and legibility after being exposed to water for 4 hours. Markings shall include the name of the item, lot number, part number and any other information required by the acquisition document (see 6.2). The name marking on the gas filter shall be "FILTER, GAS, 340 CMH (200 CFM)" and the name marking on the particulate filter shall be "FILTER, PARTICULATE, 340 CMH (200 CFM)."